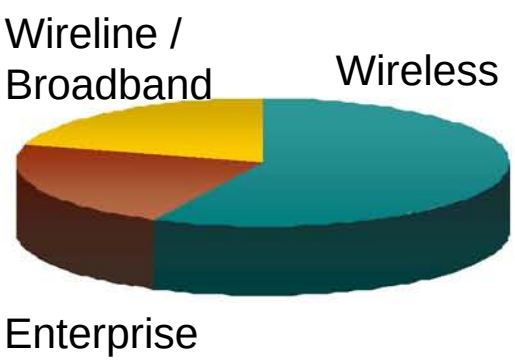
# Federal Communications Commission

## Andrew Wireless Location Systems

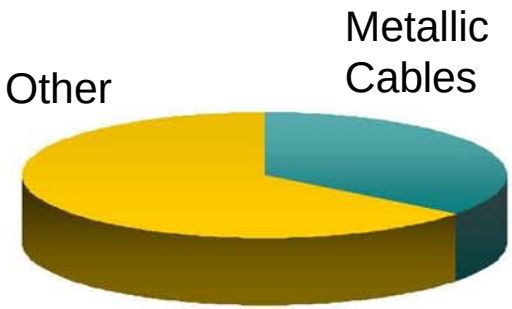
## February 25, 2010

# CommScope Global Leadership & Diversity

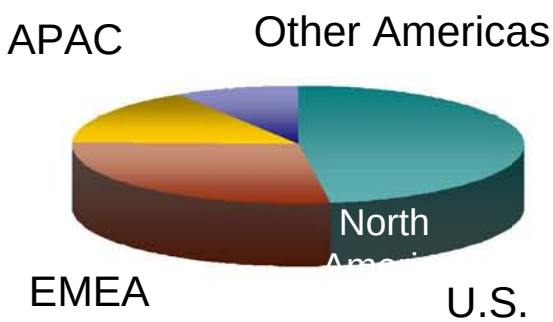
## Market Diversity




## Product Diversity




## Geographic Diversity




## Customer Diversity

- Worldwide Customer Base
- Wireline and Wireless Carriers, Cable Operators
- OEM and Preferred Supplier
- Direct Sales, Distributors and Agents

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# Andrew Solutions

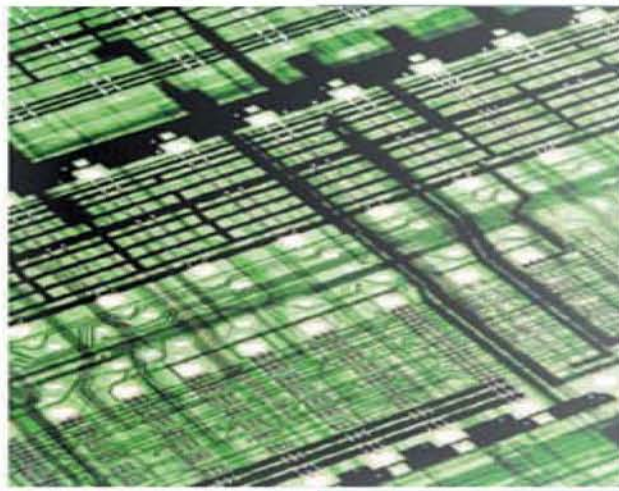
Andrew, a CommScope Company, is the foremost supplier of one-stop, end-to-end radio frequency (RF) solutions. Our Antenna, Cable, and Cabinet Group and Wireless Network Solutions Group combine to design, manufacture and deliver complete solutions for wireless infrastructure--from top-of-the-tower base station antennas to cable systems and cabinets, RF site solutions, signal distribution, wireless caller location, and network optimization.

ANDREW® A CommScope Company

# High-Performance Location Systems Since 2001

## Public Safety Caller Location

**E911**, European 112, Police, Fire Brigade, Ambulance.



## Commercial Location-Based Services Support

### Enterprise

Asset Management, Productivity Enhancement, Fleet Management, Service Dispatch

### Consumer

Family Locator, Navigation, Social Applications, Travel Assist, Medical Assist, Personal Security, Games

ANDREW® A CommScope Company

# Unparalleled Experience and Expertise

- First E911 Phase II Compliant System In Service - 2001
- Comprehensive Deployment for E911 Support:
  - 3 of the 4 National U.S. Carriers
  - Multiple Tier II and III U.S. Carriers
  - Caribbean
  - Multiple Canadian Carriers
- All Viable Real-Time Wireless Location Technologies
  - “Network-Based” and “Handset-Based”
  - “Control Plane”, “User Plane”, and “Dual-Plane”
  - Support for 2G, 3G, 4G, NG911
- Forward-Looking Location Technology
  - LTE and WiMAX Location
  - In-Building Location
  - IP-Based Network Location (NENA-ECRIT i2/i3)

# Broad Range of Location Technologies

**Complete Suite of Location Methods, Including "Hybrid"**

- **All Viable Real-time Location Technologies**

  **- "Handset-Based" "Network-Based" "Hybrid"**
- **Assisted-GPS, Hybrid, Cell ID, Enhanced CID, RTT, TA/NMR, LMU-based (U-TDOA & MREL), Others**
- **Standards Compliant/Multi-Vendor Compatibility**
- **UMTS/WCDMA, GSM, WiMAX, LTE**
- **Performance, Cost, Scalability to Serve Applications**
- **Control Plane (CoPL) and User Plane (SUPL)**
- **Solutions for IP-Based Networks**

# Single Platform for Any Application

## Andrew's 4th Generation Location System

- Can Simultaneously Serve 2G, 3G, and 4G Networks
- High-Availability/Built-In Redundancy
- High Capacity – 100s of Locations per Second
- Control Plane, User Plane, "Dual-Plane"
- Consolidates All Combinations of Location Node Types
  - GMLC, SMLC(2G), SAS(3G), E-SMLC(4G), SUPL
- Can "Tandem" Operate with Other Systems, e.g. other PDE
- Extensively Deployed and Proven
- Standards-Compliant for Multi-Vendor Network Compatibility
- Can Support E911 and Commercial Applications
  - E911 Always Has Precedence
- Can Simultaneously Support Multiple Networks

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# Wireless Location Facts

- No Single Location Method Is Suited to All Environments
  - Andrew Provides Multiple Location Technologies in a Single System
- Location Accuracy Generally Receives Most Attention, but Yield/Reliability Is Equally Important
- A-GPS Yield Decreases In Buildings and Dense Urban Environments
- Repeaters Can Affect Performance of Some Location Methods
- Hybrid and Backup Technologies Can Improve Overall Performance
- 3G and 4G Networks Permit Additional Enhancement of Location Methods
- In-Building Augmentation Requires Close Coordination with Primary Systems
- Some Methods Acceptable for Commercial LBS May Not Be Appropriate for E911
- High-Performance Wireless Location Requires Investment

# Evolution

## Improving In-Structure Performance

- Need for Improvement Catalyzed by Two Key Factors:
  - Increased In-Structure Wireless Usage
  - Continued Market Evolution to GPS-Based as Primary Means of Location
- Viable In-Structure Solution Must Acknowledge Market Necessities:
  - Fit With Deployed Network and Location System Infrastructure
  - Work With Existing Handsets
- Andrew Has Evolved & Developed Solutions to Meet the Challenges

## Transition to IP-Based Location

- Required to Improve Emergency and Other Services
- Recognizes Reality of IP-Based Networks
- NENA/ECRIT i2/i3 Model Provides Comprehensive Architectural Guidance
- Andrew Has Developed Key Components for i2/i3 Location Networks

# Summary – Andrew Wireless Location Systems

- Andrew Is An Experienced Provider of Wireless Location Systems for E911
- Andrew Systems Employ All Viable Wireless Location Methods
- Andrew Systems Support 2G, 3G, and 4G Networks. Control Plane, User Plane, Dual-Plane. Handset-based and Network-based.
- Many Carriers Use Andrew Systems for E911 and Commercial LBS Support
- Andrew Systems Provide Primary, Hybrid, and Backup Location Methods
- Andrew Focuses on All Four Dimensions of Location System Performance:

  - Accuracy, Response Time, Yield, Availability
- Andrew Has Developed Solutions to Improve In-Structure Location
- Andrew Has Developed Solutions for IP-Based Location

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